Figure 1 a diagram of two optical nodes connected with a
bundle of optical fibers

```
  ┌────────┐                                      ┌────────┐
  │ Node β │                                      │ Node α │
  └────────┘                                      └────────┘
       │              Connection requires              │
       │◄──────────────────────────────────────────────│
       │      Connection replies with pair information  │
       │───────────────────────────────────────────────►│
       │   Reply acknowledges with pair information     │
       │◄──────────────────────────────────────────────│
       │      Acknowledge reply with pair information   │
       │───────────────────────────────────────────────►│
       │   Confirm connection and pair information      │
       │◄──────────────────────────────────────────────│
       │      Confirm connection and pair information   │
       │───────────────────────────────────────────────►│
```
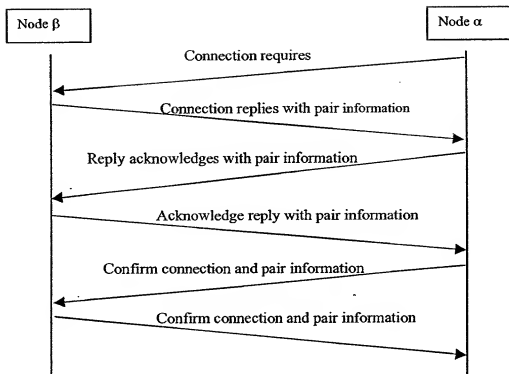
Figure 2 Handshaking protocol

Receiver scans all of its specified ingress ports for any CDM

Operator starts receiving process

A CDM on any port X? — N

Y

Finds port X's egress pair: egress port Y, and sends out the reply CDM

Remarks the ingress/egress port pair X and Y identified and remembers the node name and port numbers they are connecting

Receiver waits at port X for the reply CDM from the other node

Any performance test? — N

Y

Any reply CDM on port X?

N

Y

Tests the performance of the newly identified fiber pair and sends the result to the other node as well

Sends out the confirmation CDM and waits at port X for the reply CDM

Finishes discovering all the ports or time out? — N

Any reply confirmation CDM on port X?

N

Y

Y

STOP

Raises an alarm to the node administrator and marks the ports error
Sends out the error message through another available egress port

Figure 3 the algorithm on the receiving node
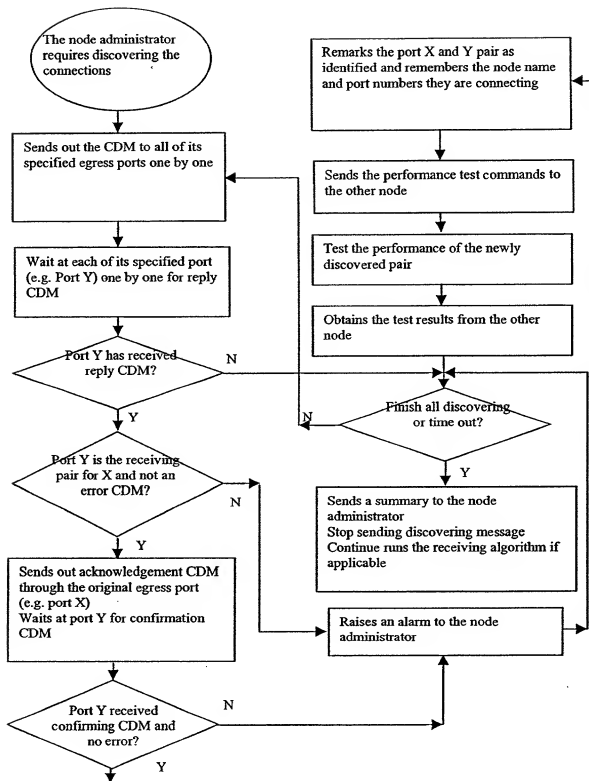
Figure 4 the algorithm on the sending node

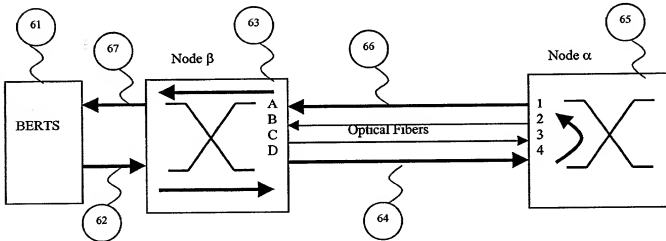| 1	2	3	4	5	6	7	8

Figure 5 Message format

Figure 6 a diagram of two optical nodes connected with a bundle of optical fibers using a Bit Error Rate Test Set (BERTS) to determine quality of connection
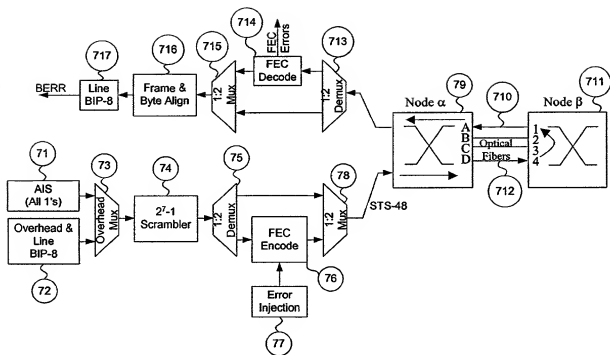
Figure 7 a diagram of two optical nodes driven by a specific Synchronous Optical Network (SONET) payload to determine the quality of the connection.